

REMARKS

INTRODUCTION

In accordance with the foregoing, claims 1, 3, 12, 13 and 15 have been amended. No new matter is being presented, and approval and entry are respectfully requested. Therefore, claims 1-15 are pending and reconsideration is respectfully requested.

OBJECTIONS TO THE CLAIMS

In the Office Action, claims 3 and 6-8 were objected to. Accordingly, claim 3 has been amended. However, regarding the objections to claims 6-8, it is noted that applicant disagrees with the notion that the claims do not further limit the subject matter of a previous claims. For example, claim 6, which depends on claim 1, recites that the variable driving current varies according to a variation of the driving current setting signal inputted to the controller. Meanwhile, claim 1 merely recites that the variable driving current is based on the driving current setting signal, which itself is based on the calculated torque. In other words, if the calculated torque remains constant, then, according to claim 1, the variable driving current may also remain constant, and, thus, non-varying. Therefore, claim 6 adds the limitation that the variable driving current actually does vary.

Similarly, claim 7 recites that the driver applies the variable driving current to the stepper motor according to the control signal inputted from the controller to drive the stepper motor. Meanwhile, claim 1 merely recites that driver drives the stepper motor based on the control signal inputted from the controller. Therefore, claim 7 provides additional subject matter.

Lastly, claim 8 recites that the torque calculator converts the detected driving current inputted from the current detector to calculate the torque applied to the stepper motor. Since neither claim 1 nor claim 2 recite this subject matter, applicant asserts that claim 8 is satisfactory.

REJECTION UNDER 35 U.S.C. §102

In the Office Action, at page 2, numbered paragraph 2, claims 1, 2, 6-8, 11, 12, 14 and 15 were rejected under 35 U.S.C. §102(b) as being anticipated by Yamada et al. (U.S. 6,037,741). This rejection is traversed and reconsideration is requested.

As amended, claims 1, 12 and 15 recite that torque, which is applied to the stepper

motor, is calculated from driving current and from stored driving current settings. Applicant respectfully asserts that these characteristics are not disclosed by the reference to Yamada.

Yamada is directed to a motor controller and a method of controlling a motor. To this end and in relevant part, the reference discloses an ECU 100 that receives a torque command value mainly input from the outside and regulates the motor currents flowing through the three phases (U, V, and W phases) of the three-phase synchronous motor 40, current sensors 102 and 103 that measure the U-phase current and the V-phase current of the three-phase synchronous motor 40, filters 106 and 107 that remove high-frequency noises from the observed electric currents, and two analog-to-digital converters (ADC) 112 and 113 that convert the observed electric currents into digital data. According to the reference, the ECU 100 acts as a torque control unit 200, the electrical angle determination unit 220, the required torque setting unit 216, which sets the externally input torque command value to the required torque T^* . See *Yamada*, column 11, line 27 - column 12, line 24.

Yamada additionally discloses that, where the torque setting unit calculates the outputted torque itself, information such as the required torque and the electrical angle are used in the calculation. See *Yamada*, column 9, line 59 - column 10, line 8. Therefore, it appears as though, in Yamada, torque is not calculated from the driving current and from stored driving current settings, as claimed.

Since, Yamada is silent as to whether torque is calculated from the driving current and from stored driving current settings, applicant respectfully asserts that amended claims 1, 12 and 15 are patentably distinguished over Yamada and that, thus, the rejections are overcome.

Regarding the rejections of claims 2, 6-8, 11 and 14, it is noted that these claims depend from claims 1 and 12 and are therefore allowable for at least the reasons set forth above.

REJECTION UNDER 35 U.S.C. §103

In the Office Action, at page 3, numbered paragraph 3, claims 3-5, 9, 10 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yamada et al. (U.S. 6,037,741). The rejection is traversed and reconsideration is requested.

According to the Office Action, Yamada teaches the features of original claims 3 and 13 that have been incorporated into claims 1, 12 and 15. However, since, as noted above, Yamada is silent as to whether torque is calculated from the driving current and from stored driving current settings, as claimed, and since Yamada fails to cure its own defects as a reference,

applicant respectfully asserts that the rejections are overcome.

Regarding the rejections of claims 4, 5, 9 and 10, it is noted that these claims depend from claim 1 are that the defects of Yamada, as discussed above, remain. Thus, these rejections are believed to be overcome.

CONCLUSION

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot. And further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.


If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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